

Name: \_\_\_\_\_

## Hardy Weinberg Practice Problems

$$p^2 + 2pq + q^2 = 1 \text{ and } p + q = 1$$

p = frequency of the dominant allele in the population (A)

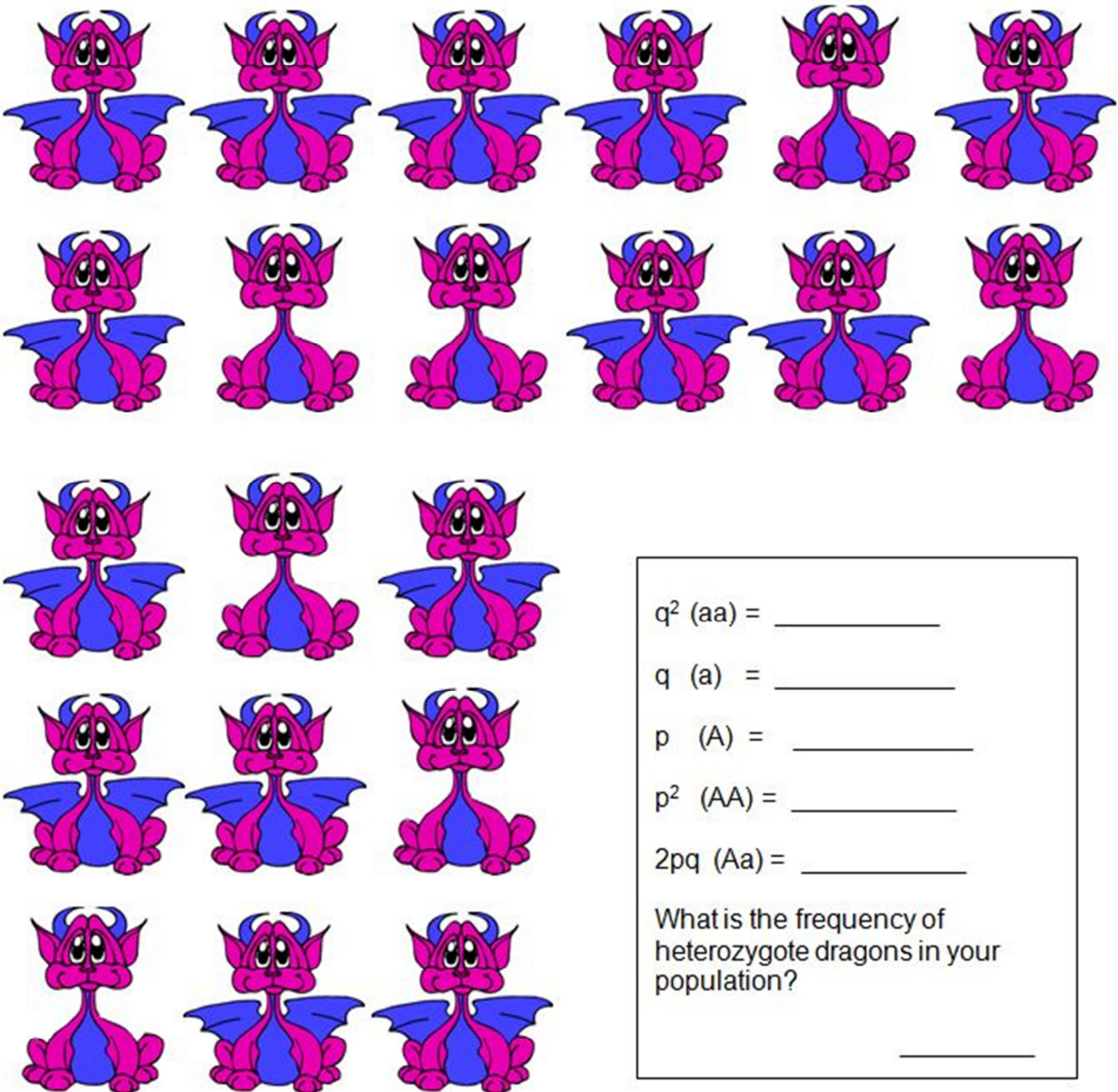
q = frequency of the recessive allele in the population (a)

$p^2$  = percentage of homozygous dominant individuals (AA)

$q^2$  = percentage of homozygous recessive individuals (aa)

2pq = percentage of heterozygous individuals (Aa)

1. View the Dragons below. The winged trait is dominant.



$q^2$  (aa) = \_\_\_\_\_

q (a) = \_\_\_\_\_

p (A) = \_\_\_\_\_

$p^2$  (AA) = \_\_\_\_\_

2pq (Aa) = \_\_\_\_\_

What is the frequency of heterozygote dragons in your population?

\_\_\_\_\_

2. You have sampled a population in which you know that the percentage of the homozygous recessive genotype (aa) is 36%. Using that 36%, calculate the following:

A. The frequency of the "aa" genotype. \_\_\_\_\_

B. The frequency of the "a" allele. \_\_\_\_\_

C. The frequency of the "A" allele. \_\_\_\_\_

D. The frequency of the genotype "AA" \_\_\_\_\_

E. The frequency of the genotype "Aa" \_\_\_\_\_

3. There are 100 students in a class. Ninety-six did well in the course whereas four blew it totally and received a grade of F. Sorry. In the highly unlikely event that these traits are genetic rather than environmental, if these traits involve dominant and recessive alleles, and if the four (4%) represent the frequency of the homozygous recessive condition, please calculate the following:

A. The frequency of the homozygous recessive individuals. \_\_\_\_\_

B. The frequency of the recessive allele. \_\_\_\_\_

C. The frequency of the dominant allele. \_\_\_\_\_

D. The frequency of the homozygous dominant individuals. \_\_\_\_\_

E. The frequency of heterozygous individuals. \_\_\_\_\_

4. Within a population of butterflies, the color brown (B) is dominant over the color white (b). If 40% of the butterflies are white, calculate the following:

A. The percentage of butterflies in the population that are homozygous recessive. \_\_\_\_\_

B. The percentage of butterflies that are homozygous dominant. \_\_\_\_\_

C. The percentage of butterflies that are heterozygous. \_\_\_\_\_

5. Cystic fibrosis is a recessive condition that affects about 1 in 2,500 babies in the Caucasian population of the United States. Please calculate the following.

A. The frequency of the recessive allele in the population. \_\_\_\_\_

B. The frequency of the dominant allele in the population. \_\_\_\_\_

C. The percentage of heterozygous individuals (carriers) in the population. \_\_\_\_\_